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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,479	03/25/2004	Barton L. Smith	T10050	8874
20449	7590	08/18/2006	EXAMINER	
KARL R CANNON PO BOX 1909 SANDY, UT 84091			DOERRLER, WILLIAM CHARLES	
			ART UNIT	PAPER NUMBER
			3744	

DATE MAILED: 08/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/811,479

Applicant(s)

SMITH, BARTON L.

Examiner

William C. Doerrler

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-158 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-145, 148 and 150-158 is/are rejected.
- 7) ☒ Claim(s) 146, 147 and 149 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7-14-2004.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-142 and 155-158 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The above claims all claim a synthetic jet being formed from an orifice in the chamber walls of a thermoacoustic engine. Applicant claims no device for producing the acoustic waves (such as a speaker or other piezo-electric device) and states in the specification that none is necessary. It is unclear how this is true. To form the synthetic jet, resonance must be achieved in the chamber. Applicant has disclosed and claimed an open ended chamber. It is unclear how resonance will be achieved in an open ended chamber with such a small temperature difference. Applicant states on page 33 that the chip temperature limit is probably close to 80 degrees C and the ambient is most likely around 20 degrees C. It is unclear how resonance will occur in an open tube with one end at 80 degrees and the entire remainder of the tube at 20 degrees. The heat will gradually conduct to the top of the cylinder which will then act as a heat sink. Applicant has provided no localized means of cooling the contents in the chamber to provide the

necessary wave. For example, the Swift article from the IDS states on page 1161 under the Heat Exchangers heading that "heat exchangers are required in thermoacoustic engines to supply and extract heat at the ends of the stack". The reference then describes the desired length of the heat exchangers for maximum wave production. Applicant has disclosed a heat exchanger, and claimed one in some of the dependent claims, but the specification is clear that the heat exchanger is optional. It is not believed that the device can function with out at least a cold heat exchanger (using the electronic device as the hot heat exchanger). Applicant was not given a 101 rejection (as lacking utility), since the device will still function as a heat sink, even if the synthetic jet does not occur.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 143, 144, 145, 148 and 150-154 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bennett in view of Keolian et al.

Bennett discloses applicants' basic inventive concept, a heat exchanger formed by removing a molding material (by etching column 6 line 21, or chemical removal) to leave only the heat exchanger material, substantially as claimed with the exception of forming the heat exchanger as a roll. Figure 1C of Keolian et al show this feature to be old in the heat exchanging stack art. It would have been obvious to one of ordinary skill in the

art at the time of applicants' invention from the teaching of Keolian to form the heat exchanger stack as a roll to provide a heat exchanger which has high surface area and is relatively easy to manufacture. In regard to the various attachment means and materials claimed, all are well known in the heat exchanger art and as such would have been obvious to one of ordinary skill in the art to provide a secure heat exchanger which is relatively easy to produce.

Claims 143,144,145,148 and 150-154 are rejected under 35 U.S.C. 103(a) as being unpatentable over Godshalk et al in view of Keolian et al. Godshalk et al discloses applicants' basic inventive concept, a heat exchanger formed by removing a molding material (silicon) to leave only the heat exchanger material, substantially as claimed with the exception of forming the heat exchanger as a roll. Figure 1C of Keolian et al show this feature to be old in the heat exchanging stack art. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of Keolian to form the heat exchanger stack as a roll to provide a heat exchanger which has high surface area and is relatively easy to manufacture. In regard to the various attachment means and materials claimed, all are well known in the heat exchanger art and as such would have been obvious to one of ordinary skill in the art to provide a secure heat exchanger which is relatively easy to produce.

***Allowable Subject Matter***

Claims 146,147 and 149 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

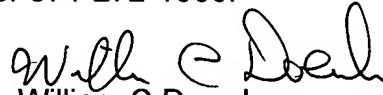
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gabrielson shows a thermoacoustic generator which uses a 350K temperature difference. Chrysler, Wells Howard and Moss show thermoacoustic systems.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Doerrler whose telephone number is (571) 272-4807. The examiner can normally be reached on Monday-Friday 6:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
William C Doerrler  
Primary Examiner  
Art Unit 3744

WCD